

Allergic contact stomatitis caused by a polyether dental impression material

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Introduction

A case of allergic contact stomatitis caused by a dental impression material is described. Adverse reactions had been reported to an older version of the material, but none since the manufacturer changed the catalyst. This is the first reported case of a patient reacting to the new catalyst, the sulfonium salt (2-cyano-1-methylethyl)dodecylethylsulfonium-tetrafluoroborate(1-).

Case History

A 50-year-old female presented with a 12-year history of increasingly severe symptoms affecting the oral mucosa following dental work. On the first occasion, the patient noted a tingling sensation in her lips and tongue on the day after dental work. She experienced worsening symptoms over the next few years, noticing that they always occurred around 24 hr after having crowns replaced or a new

crown added, which required dental impressions to be taken.

In May 2007, the patient had a 2.5-hr dental appointment to replace six crowns. She woke the following morning with severe soreness and swelling of the lips and oral mucosa, but no respiratory compromise. She developed mouth ulcers 3 days later, and these subsided after 10 days. The patient was referred to our department for assessment.

Patch testing with the European baseline, plastics and resins, dental and extended methacrylate series (Finn Chambers®; Chemotechnique Diagnostics, Vellinge, Sweden) yielded no positive results. Samples of all dental impression materials used during the patient's dental work were obtained from her dentist or directly from the manufacturers. These comprised: Impregum Penta (consisting of base paste plus catalyst paste) and Protemp II® (3M ESPE AG, Seefeld, Germany), Prestige Putty Additive® and Prestige Regular Additive® (Holtrade SRL, Badia Polesine, Italy). Patch tests were performed with the materials, prepared according to manufacturers' guidelines. International Contact Dermatitis Research Group reading criteria were used on D3 and D5 after application. There was a strongly positive reaction (++++) to Impregum Penta at D3 and D5. To confirm this result, the Impregum Penta was applied to the patient's arm for 2 days, alongside a sample of the base paste alone. Again, a strongly positive reaction (++++) was seen at D3 and D5 to Impregum Penta, but no reaction was seen to the base paste. Given that Impregum Penta has an acidic pH and is not designed to be a leave-on product, we carried out patch tests with Impregum Penta in two healthy controls to exclude a possible irritant reaction. These tests were negative at D3 and D5 in both controls.

We then obtained a sample of the active ingredient in the Impregum Penta catalyst, which is a sulfonium salt [(2-cyano-1-methylethyl)dodecylethylsulfoniumtetrafluoroborate(1-)], and performed further patch tests using 1:10 and 1:20 dilutions of the salt in pet., as directed by the manufacturer. These yielded strongly positive (++++) 1:10 dilution, D3 and D5) and positive (++) 1:20 dilution, D3 and D5) reactions. Patch tests with the same concentrations of the catalyst in two healthy controls yielded no

positive results at D3 and D5. The patient avoided Impregum Penta during subsequent dental work, and had no further reactions.

Discussion

Impregum Penta is a dental impression material based on polyether, which was first introduced in the 1960s. It is supplied as a base paste and a catalyst paste, which are mixed to produce the material used for making dental impressions.

The safety profile of Impregum Penta is very good, although until the late 1980s there were case reports of adverse reactions, including mucosal swelling and ulceration (1–4). Laboratory experiments showed delayed hypersensitivity reactions in guinea pigs that had been sensitized to the catalyst, methyldichlorobenzene sulfonate (5). Furthermore, blinded patch testing in patients who had experienced adverse reactions to both Impregum and Scutan (an epimine plastic used to construct temporary dental crowns) gave positive results for both methyldichlorobenzene sulfonate and methyl-p-toluol sulfonate, the catalyst in Scutan (6). Only one patient in the group had ever been exposed to Scutan, suggesting possible cross-reactivity between the two catalysts. In light of these findings, the catalyst in Impregum was changed in the late 1980s to the sulfonium salt (2-cyano-1-methylethyl)dodecylethylsulfonium-tetrafluoroborate(1-), and there have been no subsequent reports of adverse reactions to the material.

It seems very likely that our patient had become sensitized to the new sulfonium salt catalyst in Impregum Penta. There are no other reports of reactions to this new catalyst. This highlights the need for both dermatologists and dental surgeons to be aware of this potential contact allergen.

Conflicts of interest: The authors have declared no conflicts.

References

1. Dahl B L. Tissue hypersensitivity to dental materials. *J Oral Rehabil* 1978; 5: 117–120.
2. Blankenau R J, Kelsey W P, Cavel W T. A possible allergic response to polyether impression material: a case report. *J Am Dent Assoc* 1984; 108: 609–610.
3. Fisher A A. Allergic stomatitis from dental impression compounds. *Cutis* 1985; 36: 295–296.

4. Mountcastle E A, James W D, Rodman O G. Allergic contact stomatitis to a dental impression material. *J Am Acad Dermatol* 1986; 15: 1055–1056.
5. Hensten-Pettersen A, Nilner K, Möller B. Guinea pig maximisation test with a polyether impression material. *Scand J Dent Res* 1990; 98: 356–362.
6. Van Groeningen G, Nater J P. Reactions to dental impression materials. *Contact Dermatitis* 1975; 1: 373–376.

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